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LOW VALUE FACTORS USING
AUTOMATED BROKER INTERFACE DATA

by

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I. Introduction

Data for the monthly compilation of the trade statistics are received on a flow basis from the U.S. Customs. This information is collected from approximately 15 million documents filed annually by importers and exporters.

The data sources for U.S. import statistics are Customs import documents, which importers or their agents are required to prepare and to file with Customs officials at the ports at which the merchandise is entered. On average about 550,000 of these documents are filed monthly. Customs ports throughout the United States transmit documents to the Bureau of the Census (Jeffersonville, Indiana processing center) on an almost daily basis. Informal entry documents, prepared for merchandise valued not over the exemption level of $1000 (except for certain commodities (shoe, textile, etc.) exempted at $250), are not transmitted to the Census Bureau. All formal import documents containing import items valued over $1000 are fully processed for inclusion in the monthly import statistics. Imports of items not exceeding exemption levels ($1000 or $250 depending on commodity) in value are included on the basis of estimates. Estimates of the value of such imports are made at the country of origin level on the basis of historical relationships of low-value shipments to total value established from independent studies. Beside Customs import documents, the magnetic tapes came from the Customs through the Automated Broker Interface system (ABI), are also part of the input of the monthly import statistics. (The ABI system allows automated brokers to submit data directly to Customs.) For export statistics, the major data source is the Shipper's Export Declaration (SED). The SED is submitted by exporters to the exporting carrier, and by the exporting carrier in turn, to Customs offices at the U.S. ports of exportation prior to

departure. In the case of shipments by qualified exporters (exporters satisfying specified census criteria), monthly reports in the form of summary documents, magnetic tapes, etc., are transmitted directly to the Census Bureau. On the average, approximately 700,000 export documents are transmitted each month to the Census Bureau. Exports of commodities individually valued at $1500 and less are exempt from the document filing requirements, except when such exports are made under export licenses or to certain countries. Data for shipments valued $1500 and less are estimated, based on an established percentage of individual country totals.

In this report, we examine the low value shipment estimation procedures for imports and exports currently used by the Foreign Trade Division and explore other alternatives - using automated data - to estimate the low value ratios.

In the automated data system there exist records of items valued below the exemption levels for imports or exports. In the following, the automated data system for imports and exports is described.

The Automated Reporting Program for Exporting Companies. (Bureau of Census (1986)). The Census Bureau started this program in 1970. The program allows exporters (shippers, freight forwarders and exporting carriers) with the necessary computerized capabilities to report details on their export activities directly to the Census Bureau each month via electronic means (computer tape/computer transmission). This relieved exporters of the need to prepare and file Shipper's Export Declarations (SEDs) with exporting carriers for submission to U.S. Customs at the time and place of filing the manifest. The data sent through the automated reporting program have specified form, and the participating exporter is not required to report items valued under $1001 in the automated reporting program. The percentage of the companies in the

automated reporting program voluntarily reporting the low value export data is unknown. There are approximately 66 companies participating in this automated reporting program.

The Automated Broker Interface (ABI). (Walter and Puzzilla (1987)). ABI is part of the Customs Service Automated Commercial System (ACS). ACS is a giant computer telecommunications system linking all aspects of Customs activities at all ports throughout the United States. ABI provides electronic processing of import entries for qualified brokers and importers. Large volume brokers can transmit entry and entry summary data to ACS, receive priority cargo release and liquidation, and benefit from statement accounting on revenue collections. There are ABI brokers at all major U.S. ports and they currently account for about one-third of all import transactions filed with Customs. The Census Bureau began working with Customs to develop a program to use ABI data for statistical purposes about 4 years ago. In addition to aiding in the development of the ABI data base, the Census Bureau staff developed the Census Interface which extracts data from ABI, subjects it to Census edits and validations and reformats it for processing on Census computers. This process eliminates the need for paper documents and provides Census with pre-processed and essentially error-free data. Statistical data are currently being extracted from ABI via the Census Interface at 28 Customs ports. The remaining ports are currently testing with Census, and nationwide implementation is expected about the end of calendar year 1987. At the present time about 20 percent of all transactions in each month's statistics are extracted from ABI. Since ABI data contain below exemption level import items, the ABI data are an alternative source to estimate the import low value factors if eventually most of the import entries are processed through ABI.

In this study, we investigate the feasibility of using automated data as an alternative to the present estimates of the low value factors in imports or exports. The underlying assumption in the report is that brokers using the ABI system report all their imports on ABI, both below and above cutoff. We review the estimation procedure of the low value import and export factors used by the Foreign Trade Division in Section II. We provide a description of the ABI data used in the study and compare the low value factors estimated by the ABI data with the 1986 import data in Section III. A summary of the results appears in Section IV. Due to the small percentage (20%) of the ABI data used in the monthly imports, the alternative estimates of the low value factors (by country) calculated by using a monthly ABI data are quite different from the currently used import low value factors. We conclude that a further study is needed when a higher percentage of the ABI data are available in the monthly imports.

II. Low Value Estimation in Merchandise Trade Statistics

The merchandise trade statistics published monthly by the Census Bureau include estimated data for shipments of commodities valued under a certain cutoff. The information on U.S. export (import) shipments of commodities valued over the cutoff is fully compiled. Shipments of commodities valued under the cutoff will be estimated based on established ratios of such shipments to individual country totals. The fully compiled and estimated data will be combined to determine total exports (imports) to individual countries.

II.A. Current Low Value Estimation Procedure

The current low value estimation procedure used by FTD for exports (or imports) is as follows. Each individual country's previous month export (import) total (above the cutoff) is multiplied by an established ratio (the

so-called low value factor) to estimate the individual country's current month low value exports (imports). There are approximately 160 countries. The low value export factors were historically derived by dividing each country's total value of export items below a certain cutoff by the country's total value of export items above the cutoff. Given the above, the current month low value estimate is really the previous month low value estimate. The low value export (import) estimation began in January 1978 (August 1982) for export (import) statistics. The low value export (import) factors were updated every other year or when the cutoff was raised.

We'll describe the formation of the initial low value factor and the updated low value factor for an individual country for exports (imports).

Let $T_{0, [0,C]}$ be the total value of export documents with items valued less than or equal to the cutoff C at starting time 0.

Let $T_{0, C+}$ be the total value of export documents with items valued above the cutoff C at starting time 0.

Let $T_{0, (C, 2C]}$ be the total value of export documents with items valued greater than C and less than or equal to 2C at starting time 0.

The initial low value factor denoted by $F_{0, L}$ at starting time 0 is defined by

$$F_{0, L} = T_{0, [0, C]} / T_{0, C+} \tag{2.1}$$

The initial same increment low value factor denoted by $F_{0, U}$ at time 0 is defined by

$$F_{0, U} = T_{0, (C, 2C]} / T_{0, C+} \tag{2.2}$$

The individual country's total value of exports with items valued below the cutoff C for month i (i > 0) is estimated by

$$\tilde{T}_{i, [0, C]} = T_{i-1, C+} \times F_{0, L} \tag{2.3}$$

where $T_{i-1, C+}$ is the i-1 month individual country total value of exports with items valued above the cutoff C.

In (2.3), it is assumed that $F_{0,L}$ is constant over months within a period and $T_{i-1, C+} = T_{i, C+}$. If the latter is not assumed, $T_{i, C+}$ should be used in (2.3) instead of $T_{i-1, C+}$.

The initial low value factor $F_{0, L}$ for exports used by the Foreign Trade Division (FTD) was calculated using 3 months data (March, June, and September) of 1977, when all values of export shipments were required to report on the export document - Shipper's Export Declaration (SED) form. In January 1978, the export exemption level was set at \$500, i.e., the value of export item under \$501 was not required to be reported on the SEDs. The initial low value factor $F_{0, L}$ was updated every other year or when C was raised. The exemption level C was usually raised because of budget reasons or legal requirements.

II.A.1. Exemption Level Unchanged Through Years

The low value factor is updated every other year. The low value factor $F_{t,L}$ is updated at time t using the old factors $F_{t-1,L}$, $F_{t-1,U}$ from the previous time t-1 when the exemption level, C, is the same at time t-1 and t, i.e.,

$$F_{t,L} = F_{t-1,L} \times (F_{t,U} / F_{t-1,U}) \tag{2.4}$$

where

$$F_{t-1,L} = T_{t-1, [0,C]} / T_{t-1, C+}$$

$$F_{t-1,U} = T_{t-1, (C,2C]} / T_{t-1, C+}$$

$$F_{t,U} = T_{t, (C,2C]} / T_{t, C+} ,$$

$T_{t-1, [0,C]}$ is the individual country's total value of export (import) documents with items valued less than or equal to the cutoff C at time t-1.

$T_{t, (C,2C]}$ is the individual country's total value of export (import)

documents with items valued greater than C and less than or equal to 2C at time t, $T_{t, C+}$ is the individual country's total exports with items valued above C at time t. It can be shown algebraically that

$$F_{t,L} = F_{0,L} \times (F_{t,U} / F_{0,U}).$$

That is, the new low value factor at time t is the initial low value factor, $F_{0,L}$, multiplied by the ratio which represents the change between time t and time 0 of the same increment (C,2C] "low value factors" (F_U's). It is assumed that the change of F_L's between time t and time 0 is the same as the change of F_U's between time t and time 0. (Recall that export (import) items valued in the range C to 2C are fully reported in both times 0 and t).

II.A.2. Exemption Level Raised

•When the exemption level is raised from C to C_2 at time i ($C_2 > C$), the low value factor at time i-1, $F_{i-1,L}$, is retained as an estimate of the ratio of low value with items valued under C exports (imports) to the country total exports (imports) with items valued above C_2. Estimation of the part from C to C_2 was constructed by using the ratio of the total value of exports (imports) with items valued between C and C_2, $T_{i-1, (C,C_2]}$, to the individual country's export (import) total for items valued above C_2, T_{i-1, C_2+}, using data at time i-1. The resulting low value factors for exports (imports) in value category 0 to C_2 is then

$$F_{i,L} = F_{i-1,L} + (T_{i-1, (C,C_2]} / T_{i-1, C_2+}) \tag{2.5}$$

The old factor $F_{i-1,L}$ is assumed to estimate the ratio ($T_{i-1, [0,C]} / T_{i-1,C_2+}$), while it actually is the estimate of the ratio ($T_{i-1, [0,C]} / T_{i-1, C+}$). From the data available at time i, we can not estimate the ratios, ($T_{i-1, [0,C]} / T_{i-1, C_2+}$) or ($T_{i-1, [0,C]} / T_{i-1, C+}$), because no data were

reported below C at time i-1. Since $T_{i-1, C+} > T_{i-1, C_2+}$ implies $(T_{i-1, [0,C]} / T_{i-1, C+}) < (T_{i-1, [0,C]} / T_{i-1, C_2+})$, $F_{i-1,L}$ most likely underestimates the ratio $(T_{i-1, [0,C]} / T_{i-1, C_2+})$.

An alternative method to estimate the total exports (imports) with items valued below C_2 is as follows. We first apply $(T_{i-1, (C,C_2]}/T_{i-1,C_2+})$ to T_{i, C_2+} (to estimate the total exports (imports) of items valued from C to C_2), add this to T_{i,C_2+}, and then apply the result to $F_{i-1, L}$ to estimate the total exports (imports) of items valued from 0 to C. Hence,

$$\tilde{F}_{i,L} = \hat{T}_{i, (0,C_2]}/T_{i,C_2+}$$ (2.5a)

where

$$\hat{T}_{i, (C,C_2]} = (T_{i-1, (C, C_2]}/T_{i-1, C_2+}) \times T_{i, C_2+}$$
$$\hat{T}_{i, (0, C_2]} = \hat{T}_{i, (C, C_2]} + \{\hat{T}_{i, (C, C_2]} + T_{i, C_2+}\} \times F_{i-1, L}$$

By using equation (2.5), it can be shown that

$$\tilde{F}_{i,L} = F_{i,L} + F_{i-1,L} (T_{i-1,(C,C_2]}/T_{i-1,C_2+})$$

$$= F_{i-1,L} + (1 + F_{i-1,L})(T_{i-1, (C,C_2]}/T_{i-1,C_2+})$$ (2.5b)

Hence $\tilde{F}_{i,L} \geq F_{i,L}$.

In the alternative procedure, we assumed $T_{i-1, (C, C_2]}/T_{i-1, C_2+} = T_{i, (C, C_2]}/T_{i, C_2+}$, and $F_{i-1, L}$ is constant over time. The alternative low value factor in (2.5a) is calculated using data in time i-1 (before the exemption level was raised) and time i (during or after the exemption level was raised).

In January 1985, the exemption level for exports was raised from $500 to $1,000, the export low value factors were updated using 3 months data (March, June, and August) of 1984. In January 1987, the export exemption level was raised from $1,000 to $1,500, the export low value factors were updated using 3 months data (March, June and August) of 1986.

II.B. Import Low Value Estimation

Estimation of total low valued imports, those valued under $251, began in August 1982. The low value factors were established by observation of the percentage relationships of the under $251 import transactions to total imports in past periods by country. Prior to August 1982, estimates were based on a 1-percent sample of documents valued under $251. In January 1985, Customs raised the import exemption level from $250 to $1,000 for some commodities, while specified commodities (e.g., textiles and footwear) remained at the $250 exemption level. To accomodate this change, two low value factors were derived using 1984 data (March, June and September). The first low value factor $F_{0,L}^1$ was designed to estimate the total value of import items valued under $250 (there was no data available for the value class under $250 in 1984), the second low value factor $F_{0,L}^2$ was designed to estimate the total value of import items valued between $251 and $1,000. The two factors were calculated as follows:

Let $C_1 = \$250$, $2C_1 = \$500$, $C_2 = \$1,000$

$$F_{0,L}^1 = T_{0, (C_1, 2C_1]} / (T_{0, C_1+} - T'_{0, (C_1, C_2]}) \qquad (2.6)$$

$$F_{0,L}^2 = T'_{0, (C_1, C_2]} / T'_{0, C_2+}$$

$$= T'_{0, (C_1, C_2]} / (T'_{0, C_1+} - T'_{0, (C_1, C_2]}) \qquad (2.7)$$

where

$T_{0,\ (C_1,2C_1]}$ is a country total value of <u>all</u> shipments of commodities valued greater than C_1 and less than or equal to $2C_1$ at time 0,

$T_{0,\ C_1+}$ is a country total value of <u>all</u> shipments of commodities valued above C_1 at time 0,

$T'_{0,\ (C_1,C_2]}$ is a country total value of shipments of commodities <u>with an exemption level of C_2</u> and valued greater than C_1 and less than or equal to C_2 at time 0,

$T'_{0,\ C_2+}$ is a country total value of shipments of commodities <u>with an exemption level of C_2</u> and valued above C_2 at time 0.

Note that at time 0 (1984), the import exemption level is C_1 ($250). In January 1985, some commodities had import exemption level C_1 and others had C_2.

Note also in $F^1_{0,L}$, it is assumed that

$$T_{0,\ [0,\ C_1]} / (T_{0,\ C_1+} - T'_{0,\ (C_1,C_2]}) = T_{0,\ (C_1,\ 2C_1]} /$$
$(T_{0,\ C_1+} - T'_{0,\ (C_1,\ C_2]})$. Since no data were available below C_1, the next comparable increment of data was used instead to estimate the low value imports for items valued below C_1.

The individual country's total imports for items valued below C_1 for month i (February 1985 and later) is estimated by

$$\bar{T}_{i,\ [0,\ C_1]} = F^1_{0,L} \times T_{i-1,\ C_1+} . \tag{2.8}$$

The individual country's total imports for items valued between C_1 and C_2 with exemption level C_2 for month i (February 1985 and later) is

$$\bar{T}'_{i,\ (C_1,\ C_2]} = F^2_{0,L} \times T'_{i-1,\ C_2+} . \tag{2.9}$$

The estimate of the individual country's total imports for items valued under C_1 ($251) and items valued from C_1 to C_2 with exemption level C_2 ($1,000) is the sum of $\bar{T}_{i, [0, C_1]}$ and $\bar{T}'_{i, (C_1, C_2]}$.

Note that in (2.8) and (2.9), it is assumed that $F^1_{0,L}$ and $F^2_{0,L}$ are constant over months within a given time period, and $T_{i-1, C_1+} = T_{i, C_1+}$ and $T'_{i-1, C_2+} = T'_{i, C_2+}$. Without the latter assumptions, T_{i, C_1+} should be used in (2.8); and T_{i, C_2+} should be used in (2.9).

The import low value factors currently used by the Foreign Trade Division were updated in January 1987 using 3 months of import data (March, June and September of 1986) by a formula similar to (2.4). Let $F^1_{t,L}$ and $F^2_{t,L}$ be the individual country's current low value factors for import items valued below 251, and between 251 to 1000 respectively. Let $C_1 = \$250$, $C_2 = \$1000$, $C_3 = \$1250$, $C_4 = \$1750$.

Then

$$F^1_{t, L} = F^1_{0, L} \times \frac{F^1_{t,U}}{F^1_{0,U}} \tag{2.10}$$

$$F^2_{t,L} = F^2_{0,L} \times \frac{F^2_{t,U}}{F^2_{0,U}} \tag{2.11}$$

where

$F^1_{0,L}$ and $F^2_{0,L}$ were defined in (2.6) and (2.7),

$$F^1_{t,U} = \frac{T_{t, [C_2, C_3]}}{T'_{t, C_2+} + T'_{t, C_1+}} , \tag{2.10a}$$

$$F_{0,U}^{1} = \frac{T_{0, [C_2, C_3]}}{T_{0, C_2+} + T_{0, C_1+}} \quad , \tag{2.10b}$$

$$F_{t,U}^{2} = \frac{T_{t, [C_2, C_4]}}{T_{t, C_2+}} \quad , \tag{2.11a}$$

$$F_{0,U}^{2} = \frac{T_{0, [C_2, C_4]}}{T_{0, C_2+}} \quad , \tag{2.11b}$$

$T_{t, [C_2, C_3]}$ is the individual country's total imports for items valued between C_2 and C_3 using three months of 1986 import data. (The increment of C_2 to C_3 is \$250 which is the same from 0 to C_1.)

$T_{0, [C_2, C_3]}$ is the individual country's total imports for items valued between C_2 and C_3 using three months of 1984 import data.

T_{t, C_2+} is the individual country's total value of imports for commodities with exemption level C_2 (\$1000) and valued over C_2 using three months of 1986 import data.

T_{t, C_1+} is the individual country's total value of imports for commodities with exemption level C_1 (\$250) and valued over C_1 using three months of 1986 import data.

$T_{t, [C_2, C_4]}$ is the individual country's total imports for commodities with exemption level C_2 and valued between C_2 and C_4 using three months of 1986 import data. (The increment of C_2 to C_4 is \$750 which is the same from C_1 to C_2).

T_{0, C_1+} is the individual country's total value of imports for commodities with an exemption level of C_1 and valued above C_1 using three months of 1984 import data.

The individual country's total imports for items valued below C_1 for month i (January 1987 and after) is estimated by

$$T_{i, [0,C_1]} = F_{t,L}^1 \times T_{i-1,C_1+} \cdot \tag{2.12}$$

The individual country's total imports for items valued between C_1 and C_2 with exemption level C_2 for month i (January 1987 and after) is estimated by

$$T'_{i, (C_1,C_2]} = F_{t,L}^2 \times T'_{i-1, C_2+} \cdot \tag{2.13}$$

As before, the estimate of a country's total imports for items valued under the exemption levels is the sum of $T_{i, [0, C_1]}$ and $T'_{i, (C_1,C_2]}$. In (2.12) and (2.13), it is assumed that $F_{t,L}^1$ and $F_{t,L}^2$ are constant for two years (if the import exemption levels are not changed in two years), and that

$$T_{i-1, C_1+} = T_{i,C_1+} \quad \text{and} \quad T'_{i-1, C_2+} = T'_{i, C_2+} \cdot$$

In view of the current (import or export) low value procedure, the model assumptions underlying the estimation procedure need investigation. Especially needing investigation is the assumption that the individual country's current month import (export) total above the exemption level is the same as the previous month country's total above the exemption level. The assumption that the (import or export) low value factors are constant over a period (at most two years) needs investigation. Unfortunately, the currently reported import and export data are not a complete collection of the low value trade items. It would be difficult to evaluate the assumptions without the true low value data.

III. Import Low Value Factors Using ABI Data

The import data in the Automated Broker Interface (ABI) System collected by the Customs Service represent all of the import items (including items below exemption levels) reported by the large brokers only. We are interested in the true low value import factors by country in the ABI data which are a subset of the monthly import data. We compare the low value factors calculated using ABI data with the currently used import low value factors in this report.

III.A. Data

The data for the study were collected from June 29 to July 24, 1987 by the U.S. Customs Service using an Automated Broker Interface (ABI) system, therefore, it does not correspond to a given calendar month of data.

Four tapes of the statistical import data, and one tape of the "dropped import data" were obtained from the Foreign Trade Division. The statistical import data are the regular import data used in the monthly import tabulation which includes items with import value over the $1000 exemption level for general commodities and over the $250 exemption level for a special group of commodities (e.g., textile, shoes etc.). The dropped import data are not for regular monthly tabulation. This data set includes items with import value below exemption levels. This is of interest to us because it allows for the computation of low value factors for the Automated Broker Interface data. The ABI data are a special subset of the total import universe in the given time period.

The total records of the statistical import data files and the dropped import data file are 321,975 and 152,878 respectively. (The monthly statistical ABI records are approximately 18% - 20% of the total U.S. statistical import data.) The dropped import data are edited to obtain the

statistical low value data. In the edited stage, the nonstatistical records with 1st digit TSUSA code of 8 or 9 (except TSUSA code 8000035 - returned American goods) or import value over $1000 were deleted from our study. The total records of the combined files are 465,614. The number of records in the edited dropped import data is 143,639, about 30.8% of the total records (465,614) in the study.

The combined total records were then edited so that the country code 1000 (U.S.A.) and fiscal year '86 in the customs warehouse entry code were deleted from the study. The resulting total number of records in the study is 464,868; of which 30.5% came in through vessal, and 69.5% came in through 'other' transportation modes; all of the records have June as the survey month; while for the month of entry, 48.8% fell in June, 1987, 49.9% fell in July, 1987 and the rest, 1.3%, fell over the previous months; 19.2% of the records had value less than or equal to $250, 26.2% had value less than or equal to $500; and 34% had value less than or equal to $1000; 40.3% had value less than or equal to $1500; 44.5% had value less than or equal to $2000. (The import value for those items valued less than $250 is 0.1% of total imports; 0.7% for items valued less than $1000; 1.1% for items valued less than $1500; 1.6% for items valued less than $2000.) On a record basis by country, 40.8% of the records are from Canada, 4.5% from Mexico, 3.5% from the United Kingdom, 2.1% from France, 4.7% from the Federal Republic of Germany, 1.2% from Switzerland, 5.6% from Italy, 1.3% from Singapore, 1.4% from Mainland China, 3.5% from the Republic of Korea, 4.3% from Hong Kong, 7.7% from Taiwan, 8.6% from Japan, and less than 10.8% for the total of the rest of the countries. There are 145 countries in all. The total import value of ABI data set is $7,215,618,146. The total low value imports (for items valued below $250 for special commodities and below $1000 for other commodities) of

the ABI data set are \$38,460,210. This is 0.53 percent of the total import

value in the ABI data set. See also Table I for other information. The

record counts and import value by import value classes and by selected

countries of the ABI data are tabulated in Tables I.A. and I.B., respectively.

III.B. Estimation Procedure

The low value factors by country were tabulated using approximately one

month of ABI data. Note that in the ABI data, we have import items valued

under \$251 and \$1001 for commodities with exemption levels \$250 and \$1000,

respectively. The two low value factors $F_{A,L}^{1}$ and $F_{A,L}^{2}$ for under \$251 and

between \$251 and \$1000 respectively using one month of ABI data are calculated

for each individual country by the following formula:

$$F_{A,L}^{1} = T_{A,(0,C_1]}/(T_{A,C_1^+} - T'_{A,(C_1,C_2]})$$ (3.1)

$$F_{A,L}^{2} = T'_{A,[C_1,C_2]}/T'_{A,C_2^+}$$ (3.2)

where $C_1 = \$250$, $C_2 = \$1000$,

$T_{A,(0,C_1]}$ is the individual country's total value of imports for commodities
valued less than or equal to C_1 using ABI data,

T_{A,C_1^+} is the individual country's total value of imports for commodities
valued over C_1 using ABI data,

$T'_{A,[C_1,C_2]}$ is the individual country's total value of imports for commodities
valued between C_1 and C_2 with exemption level of C_2 using ABI data,

T'_{A,C_2^+} is the individual country's total value of imports for commodities
valued over C_2 with exemption level of C_2 using ABI data.

III.C. Data Analysis

The data used to compute the import low value factors (F_A) using ABI data are different by size, completeness and time lag with the data used to compute the current import low value factors (F_C). The current import low value factors were calculated initially using March, June and September 1984 import data (when the exemption level was $250 for all commodities), and updated by using March, June and September 1986 import data (when the exemption level was $250 for a special group of commodities and $1000 for the rest of the commodities). There are no statistics available for direct comparison of these two data sets. In Dickerson's memorandum (1984), there is a frequency tabulation for import record counts and import values for different assumed exemption levels using April 1984 import shipments. Although April 1984 was not the month used to calculate the current import low value factors, it is close enough in time to March 1984's data. In table II, the import record counts and import values were tabulated for ABI data and April 1984's import data for different exemption levels. There are 34.58% and 21.27% of records valued under $1001 for ABI data and April 1984 import shipments respectively, and the percentages of import items valued under $1001 are 0.67% and 0.44% of the total import value for ABI and April 1984 data respectively. The data in April 1984 did not have any imports with items valued below $250 because the exemption level at the time was $250 for all commodities. The ABI import data is approximately 20% of the monthly imports with 49% from June and 50% from July of 1987. In Table II, the percentages of low value import records or values for April 1984's data are less than the percentages for ABI data for different exemption levels.

The low value factors using ABI data are calculated using formulas (3.1) and (3.2) and tabulated for selected countries and compared with the currently

used import low value factors in Table III. The countries are grouped into three categories according to the percentage of the total country import record counts in the total count of the ABI records (See Table I.B). Categories A, B and C include countries with percent of records in the ABI over 1%, between 0.5% and 1%, and between 0.1% and 0.5% respectively. For countries with less than 0.1% of the total import records, the low value factors were not presented in Table III because of the small amount of import records involved. From Table III, for countries in category A, the relative differences of low value factors using ABI data and the currently used factor $(F_{A,L} - F_{C,L})/F_{C,L}$ ranged from -79.97% to 49.28% for factors used to estimate imports with items valued under $251, and from -42.50% to 43.26% for factors used to estimate imports with items valued between $251 and $1000; for countries in category B, the relative differences ranged from -69.46% to 38.57% for under $251, and from -51.49% to 439.49% for between $251 to $1000; for countries in category C, the relative differences ranged from -97.31% to 6909% for under $251, and from -98.61% to 20494% for between $251 and $1000. The relative differences of the low value factors computed using ABI data and the currently used factor, $(F_A - F_C)/F_C$, are not small, especially for countries in category C. In the country C category, Antigua showed unusual import distribution in the ABI data having 94% of its records valued below $1001 which represent 36.7% of its total import value. In the non-textile, shoe etc. commodities, 96% of the records were valued below $1000 with 70% of the import value, and 75% of the records were valued below $250 with 29% of the import value. Thus the low value factor for between $250 and $1000 exceeds 1 (1.4066). The mean and variance (in percentage) of the absolute relative difference of the low value factors using two different data sets for each country category are as follows:

Table A.

Under $251

Country Category	A	B	C
Mean	42.89	38.63	317.79
Variance	465.95	279.73	1,808,083.30

Between $251 and $1000

Country Category	A	B	C
Mean	25.60	78.91	1119.15
Variance	132.63	19142.17	17,327,534.40

The countries with absolute relative difference of F_A^1 and F_C^1 below 20% are Canada, the United Kingdom, Italy, Sweden, Indonesia, Norway, Hungary, Greece; the countries with absolute relative difference of F_A^2 and F_C^2 below 20% are Italy, Hong Kong, the United Kingdom, the Republic of Korea, China (Mainland), Brazil, Sweden, Belgium, Indonesia, and Hungary.

We tabulated the import low value factors using ABI data by world area in Table IV; and by countries within the world area in Table V. Many small countries (within other Western Hemisphere, Australia and Oceana, and Africa) have no import shipments in the ABI data, hence, no low value factors could be tabulated.

The import low value updating factors defined in (2.10a) and (2.11a) using 3 months of 1986 import data, $(F_{C,U}^1, F_{C,U}^2)$, are compared with the comparable factors calculated using ABI data, $(F_{A,U}^1, F_{A,U}^2)$, (see table VI). For category A, B and C countries, the relative differences of the updating factors for under $251, $(F_{A,U}^1 - F_{C,U}^1)/F_{C,U}^1$, ranged from -65.13% to 38.45%, -59.13% to -2.56% and -96.15% to 635.42% respectively; for between $251 and $1000, the relative differences of the updating factors $(F_{A,U}^2 - F_{C,U}^2)/F_{C,U}^2$ for countries in categories A, B and C, ranged from -25.15% to 44.00%, -34.38% to 208.59%, and -95.41% to 2116.35% respectively. The mean and variance (in percentage) of the absolute relative difference of the updating factors using

two different data sets for the countries in categories A, B and C are as follows:

Table B

Under $251

Country Category	A	B	C
Mean	39.28	34.84	83.57
Variance	413.92	504.69	13,272.09

Between $251 and $1000

Country Category	A	B	C
Mean	24.38	37.65	181.63
Variance	547.71	4227.18	175,324.68

In general, the mean and variance of the absolute relative differences of the updating factors in Table B are smaller than the corresponding mean and variance of the absolute relative differences of the low value factors in Table A for all three country categories, especially category C.

Note that the updating factors tabulated in Table VI used the same formulas (2.10a and 2.11a) but two different data sets, while the low value factors tabulated in Tables III and V used different low value factor formulas because the low value imports were missing in the 1984 and 1986 data but were not missing in the 1987 ABI data set. In Table VI the countries with absolute relative difference of updating factors less than 20% for under $251, $(F_{A,U}^{1}-F_{C,U}^{1})/F_{C,U}^{1}$, are Mexico, Singapore, Malaysia, Sweden, Belgium, Ireland, Yugoslavia and Norway; for between $251 and $1000, $((F_{A,U}^{2}-F_{C,U}^{2})/F_{C,U}^{2})$, the countries are Italy, the Federal Republic of Germany, Mexico, Hong Kong, the United Kingdom, the Republic of Korea, Singapore, Malaysia, Sweden, Thailand, Belgium, Portugal, Macao and Argentina. Also, some factors tabulated in Table VI in country category C are calculated based on less than 5 records in the low value category, e.g., Guatemala, Jamaica, Antigua, Uruguay, Hungary, Pakistan and Bangladesh.

We also used ABI data to check one of the assumptions used in calculating the initial import low value factors, i.e., that the ratio of the total imports with items valued under $251 to the individual country's total imports with items valued above the exemption levels (F^1) is approximately the same as the ratio of the total imports with items valued between $251 to $500 to the individual country's total imports with items valued above the exemption levels (F^{IC}), i.e.,

$$T_{(0,C_1]}/(T_{0,C_1+} - T'_{0,(C_1,C_2]}) = T_{(C_1,2C_1]}/(T_{0,C_1+} - T'_{0, (C_1, C_2]}) ,$$

where C_1 = $250, C_2 = $1000 (See Section II.B).

We tabulated these two ratios using ABI data for selected countries in table VII. It showed, in general, F^{IC} is bigger than F^1 for most countries except Colombia, Jamaica, Antigua and Hungary. The relative differences of these two ratios in percent, $((F^{IC}-F^1)/F^1)$, for countries in categories A, B and C ranged from 8.94% to 175.65%, 20.51% to 86.60%, and -50.51% to 250.00% respectively.

The mean and variance in percentage of the absolute relative difference $(F^{IC}-F^1)/F^1$ by country category are as follows:

Table C

Country category	A	B	C
Mean	59.91	49.70	72.05
Variance	2360.71	605.59	3175.95

Hence, for ABI data, the low value (< $250) ratio F^1 is different from the same increment ratio ($250 to $500), F^{IC}. The same increment ratio F^{IC} is bigger than the low value ratio F^1 for most countries. From Table C the average absolute relative differences are different by countries with

countries in category B giving the smallest difference with an average of 49.70%.

IV. Summary

In this report, we reviewed the low value estimation procedures for exports and imports used by the Foreign Trade Division. The low value shipments are estimated by a ratio procedure. Model assumptions are used in the low value estimation procedure. Since data are not required to be reported to the Bureau of the Census for shipments of commodities below the exemption level, it is very difficult to check the underlying model assumptions.

The import data from the ABI system contain all import items including the below exemption level imports. We examined the feasibility of using Customs Service's ABI data as an alternative source for estimating low value factors for imports. Unfortunately, this ABI data set is only about 20% of the total monthly imports in June or July 1987. Many countries have no import shipments in this data set. We examined 48 out of 145 countries with import record counts over 0.1% of the total ABI records (464,868) used in the study. In the 48 countries we compared the low value factors calculated by using ABI data (F_A) with the low value factors (F_C) currently used by Foreign Trade Division. They are different for most of the 48 countries. Even for large trade countries e.g., Canada, Japan, Taiwan, Italy, Germany, Hong Kong, and the United Kingdom, the magnitude of the relative difference $(F_A-F_C)/F_C$ is significantly different by country, ranging from -69.90% to 49.28% (see Table III). The factors, F_C and F_A, are not really comparable. F_C's are the estimates of the low value factors using 6 months data from 1984 and 1986; while F_A's are the "true" low value factors using 4 weeks of ABI data

collected from June 29 to July 24, 1987 which are approximately 20% of the total monthly imports. For each country, which of these two factors F_C and F_A is closer to the true low value factor is unknown. It depends on the period of the import data targeted. In the current low value estimation procedure, it is assumed that for each country, the low value factor is constant over all months within a 2 year span.

We examined the relative differences of the import updating factors using ABI data and the currently used updating factors relative to the current updating factors for the 48 countries. The magnitude of the relative difference of the updating factors varies by country. However, in general, the differences of the two data sets for updating factors are smaller than the low value factors for most countries.

We examined one of the assumptions used in the current low value import estimation procedure using ABI data, i.e., for each country, the ratio of the total import items valued under $251 to the individual country's total import items above the exemption levels is the same as the ratio of the total import items valued between $251 to $500 to the individual country's total import items above the exemption levels. For the ABI data the latter ratios are bigger than the former ratios, for most countries.

We calculated the low value factors by world area and by country within the world area using ABI data. The low value factors vary by country within world area.

Based on our study, we conclude that the low value factors calculated using ABI data are different from the currently used low value import factors. For most countries, the currently used low value factors are bigger than the low value factors calculated using ABI data.

Since eventually the Customs Service anticipates that 90 percent of all
import entries will be processed through ABI, a similar study is needed at the
time when the ABI data represent a higher percentage of the monthly imports.
Also several months of ABI data need to be analyzed to check the model
assumptions underlying the low value estimation procedure. We recommend using
current month country total imports to estimate the current month country low
value imports instead of using the previous month country imports since
imports from a country are not constant over time. All the conclusions are
based on the underlying assumption that the ABI contains all import data, both
above and below cutoff, for the brokers who use this automated system. This
should be verified before extensive use is made of the ABI data to measure
below cutoff imports.

As for exports, since the proportion of the low value exports reported by
the companies participating in the Automated Reporting Program is unknown, it is
not clear whether it is worthwhile to use the data in the Automated Reporting
Program as an alternative source to estimate the export low value factors.

by Cary Isaki and Nash Monsour. Chris Dyke and Robert Creecy assisted in data

transmission and computer programming. Alice Bell patiently typed the report.

V. References

1. Walter, Bruce C. and Puzzilla, Kathleen (1987). 'Recent Developments in
    Foreign Trade Statistics' paper presented to the Census Advisory
    Committees of the American Marketing Association and the American Economic
    Association at the Joint Advisory Committee Meeting,
    October 8-9, 1987.

2. Bureau of the Census (1986). U.S. Foreign Trade Automated Reporting
    Program for Exporting Companies.

3. David Dickerson (1984). April Import Shipments Valued Under $2501, $2001,
    $1501 and Under $1001. An internal memorandum from David Dickerson to
    Bruce Walter July 16, 1984.

4. Ellman, John II. (1985). Low-Value Estimating Factors - Exports.
    Unpublished Memorandum. Foreign Trade Division, Bureau of the Census.

5. Walter, Bruce (1984). Low-Value Estimating Factors for Imports.
    Unpublished Memorandum. Foreign Trade Division, Bureau of the Census,
    Washington, D.C.

6. Bureau of the Census. Import Statistics Program. An internal document
    from Foreign Trade Division.

7. Bureau of the Census. Export Statistics Program. An internal document
    from Foreign Trade Division.

Table I. The Number of Records and Import Value of the ABI Data (June 29 to July 24, 1987)

| | Record Count | | | Value of Records | | |
Value Range	Record Count	Percent of Records %	Percent of Total Records %	Value of Records 10^3	Percent of the Value %	Percent of Total Value %
A. Shoe Textile etc.						
Less than $251	17,504	17.61	3.77	1,665.492	0.14	0.02
Between $251 and $1000	17,294	17.40	3.72	9,794.345	0.82	0.14
Greater than $1000	64,616	64.99	13.90	1,187,415.703	99.04	16.45
Total	99,414	100.00	21.39	1,198,875.540	100.00	16.62
B. Not Shoe, Textile etc.						
Less than $251	71,654	19.60	15.41	6,048.939	0.10	0.08
Between $251 and $1000	54,297	14.86	11.68	30,745.779	0.51	0.43
Greater than $1000	239,503	65.54	51.52	5,979,947.888	99.39	82.87
Total	365,454	100.00	78.61	6,016,742.606	100.00	83.38
C. All Commodities						
Less than $251	89,158	19.18		7,714.431	0.11	
Between $251 and $1000	71,591	15.40		40,540.124	0.56	
Greater than $1000	304,119	65.42		7,167,363.591	99.33	
Total	464,868	100.00	100.00	7,215,618.146	100.00	100.00

Table I.A. The Number of Records and Import Value of the ABI Data by Import Value Range

Import Value Range	Record Count	Percent of Total Records %	Value of Records $10³	Percent of Total Value %
All Commodities				
Less than $251	89,158	19.18	7,714.431	0.11
Between $251 and $500	32,412	6.97	11,924.833	0.16
Between $501 and $1000	39,179	8.43	28,615.291	0.40
Between 1001 and $1500	26,439	5.69	32,669.420	0.45
Between $1501 and $2000	19,457	4.19	33,932.287	0.47
Greater than $2000	258,223	55.54	7,100,761.884	98.41
Total	464,868	100.00	7,215,618.146	100.00

Table I.B. The Import Record Count and the Import Value for the Selected Countries of ABI Data

Country	Country Code	Record Count	Percent of Total Records	(a) Import Value	Percent of Total Imports	(b) Import Value Below Cutoffs	Percent of Low Value to Country Imports (b)/(a)
			%	10^3	%	10^3	%
(A)							
Canada	1220	189,687	40.8	1,835,055.125	25.43	17,635.195	0.96
Japan	5880	40,100	8.6	1,214,454.034	16.83	3,664.875	0.30
China T	5830	35,943	7.7	629,846.834	8.73	2,278.061	0.36
Italy	4750	26,012	5.6	200,267.763	2.78	1,196.839	0.60
FR Germ	4280	21,700	4.7	349,242.949	4.84	2,518.566	0.72
Mexico	2010	20,937	4.5	256,043.782	3.55	2,415.038	0.94
HG Kong	5820	19,841	4.3	263,166.396	3.65	954.516	0.36
U. K.	4120	16,213	3.5	217,396.165	3.01	1,608.087	0.74
Kor Rep	5800	16,283	3.5	443,521.825	6.15	518.804	0.12
France	4270	9,546	2.1	184,425.414	2.56	818.589	0.44
China M	5700	6,602	1.4	141,650.114	1.96	253.783	0.18
Singapore	5590	5,818	1.3	176,759.468	2.45	425.456	0.24
Switzerland	4410	5,777	1.2	68,017.554	0.94	767.140	1.13
(B)							
Brazil	3510	3,806	0.8	129,014.050	1.79	127.648	0.10
Netherlands	4210	3,696	0.8	57,913.340	0.80	382.910	0.66
Malaysia	5570	3,565	0.8	57,817.622	0.80	314.382	0.54
Sweden	4010	2,848	0.6	34,410.832	0.48	311.939	0.91
Phil R	5650	2,977	0.6	37,793.271	0.52	219.427	0.58
Thailand	5490	2,776	0.6	52,318.890	0.73	129.796	0.25
Belgium	4230	2,486	0.5	54,824.478	0.76	166.572	0.30
Spain	4700	2,346	0.5	43,683.577	0.61	96.172	0.22
India	5330	2,317	0.5	22,437.892	0.31	109.694	0.49

Table I.B Continued

Country	Country Code	Record Count	Percent of Total Records %	(a) Import Value $10^3	Percent of Total Imports %	(b) Import Value Below Cutoffs $10^3	Percent of Low Value to Country Import (b)/(a) %
(C)							
Australia	6021	1942	0.4	40,145.749	0.56	198.508	0.49
Dom Republic	2470	1386	0.3	32,056.857	0.44	32.418	0.10
Portugal	4710	1168	0.3	15,238.013	0.21	67.190	0.20
Israel	5080	1172	0.3	24,501.765	0.34	48.632	0.20
Costa Rica	2230	736	0.2	20,701.284	0.29	36.544	0.18
Haiti	2450	701	0.2	8,440.189	0.12	42.904	0.51
Finland	4050	832	0.2	24,300.028	0.34	59.479	0.24
Ireland	4190	808	0.2	13,454.036	0.19	83.432	0.62
Austria	4330	1138	0.2	21,215.761	0.29	106.351	0.50
Yugoslavia	4790	804	0.2	12,547.907	0.17	58.899	0.47
Indonesia	5600	929	0.2	31,447.368	0.44	12.090	0.04
Macao	5660	1094	0.2	19,143.265	0.27	28.609	0.15
Guatamala	2050	274	0.1	10,797.989	0.15	7.244	0.07
Jamaica	2410	345	0.1	8,616.497	0.12	12.816	0.15
Antigua	2484	245	0.1	112.958	0.00	41.480	36.72
Colombia	3010	387	0.1	29,706.478	0.41	7.810	0.03
Uruguay	3550	235	0.1	4,584.447	0.06	1.445	0.03
Argentina	3570	505	0.1	17,818.282	0.25	20.571	0.12
Norway	4030	449	0.1	11,245.272	0.16	30.154	0.27
Hungary	4370	277	0.1	4,740.011	0.07	11.700	0.25
Greece	4840	255	0.1	3,744.718	0.05	16.974	0.45
Turkey	4890	330	0.1	26,084.003	0.36	10.229	0.04
Pakistan	5350	242	0.1	4,367.821	0.06	4.104	0.09
Bangladesh	5380	360	0.1	7,522.057	0.10	2.521	0.03
Sri Lanka	5420	491	0.1	10,262.216	0.14	2.564	0.02
New Zealand	6141	495	0.1	18,693.210	0.26	34.490	0.18

Table II.   The Comparison of the Distribution of Import Record Count and
Import Value for Two Data Sets by Different Exemption Levels

| | ABI Data (June 29 to July 24, 1987) | | | | April 1984 Import Shipment * | | | |
Value Range	Record Count	Percent of Total Record Count %	Value of Records 10^3	Percent of Total Value %	Record Count	Percent of Total Record Count %	Value of Records 10^3	Percent of Total Value %
Under $2,001	206,645	44.45	114,856.262	1.59	360,637	33.99	323,154.996	1.13
Under $1,501	187,188	40.33	80,923.975	1.12	302,552	28.52	221,886.305	0.77
Under $1,001	160,749	34.58	48,254.555	0.67	225,601	21.27	126,502.203	0.44
Total	464,868		7,215,618.146		1,060,855		28,664,886.133	

* Data source: David Dickerson memorandum (to Bruce Walter) July 16, 1984.

Table III. The Comparison of Import Low Value Factors F_A (ABI) With F_C (Current) by Country

| Country | Country Code | Under $251 | | | Between $251 and $1000 | | |
		$F^1_{C,L}$	$F^1_{A,L}$	$\frac{F^1_{A,L}-F^1_{C,L}}{F^1_{C,L}}$ %	$F^2_{C,L}$	$F^2_{A,L}$	$\frac{F^2_{A,L}-F^2_{C,L}}{F^2_{C,L}}$ %
(A)							
Canada	1220	0.00181	0.00167	-7.85	0.00652	0.00842	29.14
Japan	5880	0.00106	0.00057	-45.77	0.00395	0.00251	-36.46
China T	5830	0.00191	0.00057	-69.90	0.00669	0.00502	-24.89
Italy	4750	0.00365	0.00295	-19.28	0.00620	0.00506	-18.39
Fr Germ	4280	0.00224	0.00146	-34.89	0.00859	0.00604	-29.69
Mexico	2010	0.00138	0.00206	49.28	0.00548	0.00785	43.26
Hong Kong	5820	0.00276	0.00123	44.57	0.00826	0.00665	-19.50
United Kingdom	4120	0.00202	0.00172	-14.65	0.00669	0.00614	-8.17
Kor Rep.	5800	0.00061	0.00026	-56.64	0.00196	0.00166	-15.55
France	4270	0.00272	0.00099	-63.67	0.00638	0.00367	-42.50
China M	5700	0.00117	0.00023	-79.97	0.00359	0.00329	-8.35
Singapore	5590	0.00073	0.00043	-41.07	0.00291	0.00221	-24.05
Switzerland	4410	0.00199	0.00259	30.08	0.00704	0.00935	32.86
(B)							
Brazil	3510	0.00040	0.00025	-36.34	0.00106	0.00098	-7.88
Netherlands	4210	0.00188	0.00124	-34.28	0.00749	0.00557	-25.64
Malaysia	5570	0.00065	0.00090	38.57	0.00284	0.00562	97.92
Sweden	4010	0.00238	0.00215	-9.66	0.00741	0.00740	-0.13
Phil R	5650	0.00203	0.00097	-52.22	0.00586	0.00866	47.75
Thailand	5490	0.00154	0.00047	-69.46	0.00624	0.00303	-51.49
Belgium	4230	0.00086	0.00055	-35.87	0.00277	0.00272	-1.83
Spain	4700	0.00099	0.00053	-46.01	0.00304	0.00230	-24.34
India	5330	0.00099	0.00124	25.30	0.00157	0.00847	439.49

Table III. continued

Country	Country Code	Under $251			Between $251 and $1000		
		$F^1_{C,L}$	$F^1_{A,L}$	$\dfrac{F^1_{A,L}-F^1_{C,L}}{F^1_{C,L}}$ %	$F^2_{C,L}$	$F^2_{A,L}$	$\dfrac{F^2_{A,L}-F^2_{C,L}}{F^2_{C,L}}$ %
(C)							
Australia	6021	0.00079	0.00095	20.25	0.00242	0.00426	76.03
Dom Republic	2470	0.00240	0.00040	-83.33	0.00652	0.00165	-74.69
Portugal	4710	0.00193	0.00111	-42.49	0.00468	0.00587	25.43
Israel	5080	0.00057	0.00034	-40.35	0.00219	0.00019	-91.32
Costa Rica	2230	0.00068	0.00022	-70.59	0.00292	0.00372	27.40
Haiti	2450	0.00302	0.00107	-64.57	0.00608	0.00961	58.06
Finland	4050	0.00138	0.00050	-63.77	0.00477	0.00205	-57.02
Ireland	4190	0.00161	0.00111	-31.06	0.00389	0.00581	49.36
Austria	4330	0.00243	0.00100	-58.85	0.00886	0.00423	-52.26
Yugoslavia	4790	0.00094	0.00049	-47.87	0.00207	0.00938	353.14
Indonesia	5600	0.00022	0.00021	-4.55	0.00024	0.00024	0
Macao	5660	0.00109	0.00019	-82.57	0.00368	0.00633	72.01
Guatamala	2050	0.00110	0.00019	-82.73	0.00249	0.00060	-75.90
Jamacia	2410	0.00158	0.00055	-65.19	0.00538	0.00318	-40.89
Antigua	2484	0.00339	0.23761	6909.14	0.00683	1.40660	20494.49
Colombia	3010	0.00297	0.00008	-97.31	0.01444	0.00020	-98.61
Uruguay	3550	0.00030	0.00012	-60.00	0.00032	0.00116	262.50
Argentina	3570	0.00051	0.00033	-35.29	0.00129	0.00089	-31.01
Norway	4030	0.00041	0.00046	12.20	0.00140	0.00227	62.14
Hungary	4370	0.00107	0.00099	-7.48	0.00284	0.00330	16.20
Greece	4840	0.00103	0.00092	-10.68	0.00235	0.00502	113.61
Turkey	4890	0.00083	0.00012	-85.54	0.00177	0.00035	-80.23
Pakistan	5350	0.00097	0.00039	-59.79	0.00177	0.00222	25.42
Bangladesh	5380	0.00037	0.00010	-72.97	0.00007	0.00479	6742.85
Sri Lanka	5420	0.00102	0.00010	-90.20	0.00128	0.00218	70.31
New Zealand	6141	0.00086	0.00031	-63.95	0.00317	0.00167	-47.32

Table IV. The Import Low Value Factors F_A by World Area Using ABI Data

World Area	World Area Code	Record Count	Under $251 $F_{A,L}^1$	$251-$1000 $F_{A,L}^2$
Canada	2	189,687	0.00167	0.00842
Central American Common Market	4	1,316	0.00030	0.00167
Latin American Free Trade Assoc.	5	26,643	0.00102	0.00400
Other Latin American Republic	6	2,206	0.00053	0.00365
Other Western Hemisphere	7	823	0.00217	0.01295
United Kingdom	11	16,213	0.00172	0.00614
Federal Republic of Germany	12	21,700	0.00146	0.00604
Other EEC Countries	13	48,893	0.00167	0.00433
Other OECD Countries	14	11,446	0.00158	0.00583
Other Western Europe	15	828	0.00053	0.00951
Communist Area in Asia	18	6,603	0.00023	0.00329
Japan	19	40,100	0.00057	0.00251
Near East Asia	21	1,406	0.00016	0.00079
South Asia	22	3,453	0.00069	0.00739
Asia, N.E.C.	23	89,248	0.00059	0.00391
Australia and Oceania	24	2,453	0.00074	0.00347
Africa	25	639	0.00010	0.00029

Table V. The Import Low Value Factors F_A (ABI) and F_C (Current)
By World Area and Country

		F_A^1	F_C^1	F_A^2	F_C^2
(04) Central American Common Market		0.00030		0.00167	
2050	Guatamala	0.00019	0.00110	0.00060	0.00249
2110	Salvador	0.00189	0.00060	0.00193	0.00151
2150		0.00018	0.00021	0.00046	0.00057
2190		--	0	--	0.00307
2230	Costa Rica	0.00022	0.00068	0.00372	0.00292
(05) Latin American Free Trade Area		0.00102		0.00400	
2010	Mexico	0.00206	0.00138	0.00785	0.00548
3010	Colombia	0.00008	0.00297	0.00020	0.01444
3070	Venezuela	0.00001	0.00002	0.00003	0.00009
3310	Equador	0.00002	0.00016	0.00036	0.00049
3330	Peru	0.00034	0.00035	0.00062	0.00069
3350	Bolivia	0.00372	0.00042	0.00776	0.00033
3370	Chile	0.00029	0.00028	0.00098	0.00106
3510	Brazil	0.00025	0.00040	0.00098	0.00106
3530	Paraguay	0	0.00080	0	0.00133
3550	Uruguay	0.00012	0.00030	0.00116	0.00032
3570	Argentina	0.00033	0.00051	0.00089	0.00129
(06) Other Latin American Republic		0.00053		0.00365	
2250	Panama	0.0003	0.00047	0.00506	0.00135
2390		--	0	--	0
2450	Haiti	0.0011	0.00302	0.00961	0.00608
2470	Domican Republic	0.0004	0.00240	0.00165	0.00652

Table V. Continued

		F_A^1	F_C^1	F_A^2	F_C^2
(07) Other Western Hemisphere		0.00217		0.01295	
1010	Greenland	--	0.00017	--	0.00017
1610		--	0.00012	--	0.00091
2080	Belize	0.00353	0.00063	--	0.00283
2320	Bermuda	0.02689	0.00251	0.26174	0.01812
2360	Bahamas	0.00128	0.00014	0.11275	0.00042
2410	Jamaica	0.00055	0.00158	0.00318	0.00538
2430	Turk Is.	--	0.00103	0.00174	0.00758
2440	Cayman	0.00036	0.00060	0.00583	0.00064
2481		--	0.00117	--	0.00462
2482		--	0.00062	--	0.00296
2483	St. C N	0.00142	0.00122	--	0.00209
2484	Antigua	0.23761	0.00339	1.40660	0.00683
2485		--	0.00049	--	0.01295
2486	Dominca	--	0.00251	--	0.51498
2487	S Lucia	0.00180	0.01128	--	0.01258
2488	S Vincent	--	0.00218	--	0.00444
2489	Grenada	--	0.00033	--	0.00034
2720	Barbados	0.00057	0.00096	0.00998	0.00353
2740	Trinidad	0.00067	0.00002	0.00623	0.00019
2770		--	--	--	--
2771	N Antil	--	0.00019	--	0.00058
2779		--	0	--	0
2830	F W Ind	--	0.00858	0.33894	0.03375
3120	Guyana	--	0.00053	--	0.00184
3150	Surinam	--	0.00009	--	0.00069
3170	F Guian	--	0	--	0
3720		--	0.16184	--	0.12300

Table V. Continued

		F_A^1	F_C^1	F_A^2	F_C^2
(13) Other EEC Countries		0.00167		0.00433	
4090	Denmark	0.00274	0.00353	0.00788	0.00854
4190	Ireland	0.00111	0.00161	0.00581	0.00389
4210	Netherlands	0.00124	0.00188	0.00557	0.00749
4230	Belgium	0.00055	0.00086	0.00272	0.00277
4270	France	0.00099	0.00272	0.00367	0.00638
4700	Spain	0.00053	0.00099	0.00230	0.00304
4710	Portugual	0.00111	0.00193	0.00587	0.00468
4750	Italy	0.00295	0.00365	0.00506	0.00620
4840	Greece	0.00092	0.00103	0.00502	0.00235
(14) Other OECD Countries		0.00158		0.00583	
4000	Iceland	0.00231	0.00048	--	0.00044
4010	Sweden	0.00215	0.00238	0.00740	0.00741
4030	Norway	0.00046	0.00041	0.00227	0.00140
4050	Finland	0.00050	0.00138	0.00205	0.00477
4330	Austria	0.00100	0.00243	0.00423	0.00886
4410	Switzerland	0.00259	0.00199	0.00935	0.00704
4890	Turkey	0.00012	0.00083	0.00035	0.00177
(15) Other Western Europe		0.00053		0.00951	
4720	Gibralta	--	0.04755	--	0.03427
4730	Malta	--	0.00122	0.00856	0.00726
4790	Yugoslavia	0.00049	0.00094	0.00938	0.00207
4910	Cyprus	0.01073	0.00061	0.03818	0.00206

Table V. Continued

		F_A^1	F_C^1	F_A^2	F_C^2
(18) Communist Area in Asia		0.00023		0.00329	
5520		--	0	--	0
5700	China M	0.00023	0.00117	0.00329	0.00359
5740		--	0.00903	--	0
5790		--	0.02200	--	0
(21) Near East Asia		0.00016		0.00079	
5020		--	0.03171	--	0.01484
5040	Lebanon	0.00186	0.00448	0.00079	0.01013
5050		--	0	--	0.00941
5070	Iran	0.00001	0.00005	--	0.00011
5080	Israel	0.00034	0.00057	0.00195	0.00219
5110		--	0.00566	--	0.00803
5120		--	0	--	0.02651
5130		--	0.00002	--	0.00025
5170	S. Arab	0.00026	0	0.00088	0.00002
5180	Qatar	0.04069	0.00118	0.41914	0.02329
5200	Arab EM	0.00048	0.00030	0.00510	0.00033
5210		--	0	--	0.00978
5220		--	0	--	0
5230	Oman	0.04657	0.00005	0.14500	0.00026
5250	Bahrain	0.01110	0.00165	0.05723	0.00077
(22) South Asia		0.00069		0.00739	
5310		--	0.00071	--	0
5330	India	0.00124	0.00099	0.00847	0.00157
5350	Pakistan	0.00039	0.00097	0.00222	0.00177
5360		--	0.00248	--	0.01279
5380	Bangladesh	0.00010	0.00037	0.00479	0.00007
5420	Sri Lanka	0.00010	0.00102	0.00218	0.00128

Table V. Continued

		F_A^1	F_C^1	F_A^2	F_C^2
(23) Asia, N.E.C.		0.00059		0.00391	
5460		0.00010	0.00003	--	0.00145
5490	Thailand	0.00047	0.00154	0.00303	0.00624
5530		--	0.00081	--	0.00914
5550		--	0	--	0.00417
5570	Malaysia	0.00090	0.00065	0.00562	0.00284
5590	Singapore	0.00043	0.00073	0.00221	0.00291
5600	Indonesia	0.00021	0.00022	0.00024	0.00024
5610		--	0	--	0.00014
5650	Phil R	0.00097	0.00203	0.00866	0.00586
5660	Macao	0.00019	0.00109	0.00633	0.00368
5682	Bhutan	--	0.00663	--	0.05948
5683		--	0.00076	--	0
5800	Kor Rep	0.00026	0.00061	0.00166	0.00196
5820	Hong Kong	0.00123	0.00276	0.00665	0.00826
5830	China T	0.00057	0.00191	0.00502	0.00669
(24) Australia and Oceania		0.00074		0.00347	
6021	Australia	0.00095	0.00079	0.00426	0.00242
6022		--	0	--	0
6023		--	0	--	0
6024		--	0.00310	--	0.01345
6029		--	0.21428	--	0.21428
6040		0.00002	0.00014	--	0.00095
6141	N. Zealand	0.00031	0.00086	0.00167	0.00317
6142		--	0	--	0.00094
6143		--	0.00319	--	0.06202
6144		--	0.00557	--	0
6150		--	0.07505	--	0.05884
6223		--	0.00136	--	0.00421
6224		--	0.00685	--	0.01567

Table V. Continued

		F_A^1	F_C^1	F_A^2	F_C^2
(24) Australia and Oceania (continued)					
6225		--	0.23662	--	0.31387
6226		--	0.00717	--	0.01016
6227		--	0	--	0
6412		--	0.00010	--	0.00095
6413		--	0.00076	--	0.00076
6414		--	0	--	0.01902
6810		--	--	--	--
6820		--	--	--	--
6850		--	0.00224	--	0.02453
6862		--	0.00549	--	0
6863		--	0.00255	0.05219	0.01621
6864		--	0.02579	--	0.05319
(25) Africa		0.00010		0.00029	
7140	Morocco	0.00293	0.00467	0.01890	0.00215
7210		--	0	--	0.00002
7230	Tunisia	0.00136	0.01040	0.01549	0.00132
7250		--	0	--	0.01081
7290	Egypt	0.00003	0.00079	0.00002	0.00106
7320		--	0.00021	--	0.00127
7370		--	0	--	0
7380		--	0	--	0
7410		--	0	--	0
7420		--	0.00001	--	0.00001
7440		--	0.00348	--	0.01729
7450		--	0.04005	--	0.02704
7460		--	0.00004	--	0.00015
7470		--	0	--	0.00001

Table V. Continued

		F_A^1	F_C^1	F_A^2	F_C^2
(25) Africa (continued)					
7480	Ivy Cst	0.00012	0.00005	0.00025	0.00027
7490		--	0.00010	--	0.00055
7500		--	0.00768	--	0.01656
7510		--	0.00926	--	0.00656
7520		--	0	--	0.00001
7530		--	0.00002	--	0.00005
7540		--	0.00175	--	0.00009
7550		--	0.00009	--	0.00009
7560		--	0	--	0
7580		--	0.00090	--	0.00350
7600		--	0.10412	--	0.19092
7610		--	0.05631	--	0.05067
7620		--	0	--	0
7630	Co Braz	--	0.00002	0.00132	0.00003
7642		--	0	--	0.06677
7643		--	0	--	0.00228
7644		--	0	--	0.01118
7650		--	0.00002	--	0.00050
7660		--	0.00024	--	0.00060
7670		--	0.00047	--	0.00117
7690		--	0	--	0
7700		--	0.05654	--	0.03730
7740	Ethiopia	--	0.00012	0.00030	0.00063
7770		--	0	--	0
7780		--	0.00006	--	0.00003
7790	Kenya	0.00008	0.00102	0.00254	0.00406

Table V. Continued

		F_A^1	F_C^1	F_A^2	F_C^2
7800		--	0.06191	--	0.02180
7810		--	0.00816	--	0.01119
7830		--	0.00058	--	0.00316
7850	Maurit	0.00040	0.00070	0.00824	0.00033
7870		--	0.00122	--	0.00039
7880		--	0	--	0.00038
7890		--	0.00119	--	0.00240
7900		--	0	--	0.00700
7910		0.00026	0.00018	0.00063	0.00055
7920		--	0.00035	--	0.00097
7930		--	0.00409	--	0.00161
7940		--	0	--	0.00002
7950		--	0	--	0
7960		--	0.00046	--	0.00166
7970	Malawi	--	0.00026	0.03759	0.00057
7990		0.00122	0.00554	--	0.00100
(2) Canada		0.00167	0.00181	0.00842	0.00652
(11) United Kingdom		0.00172	0.00202	0.00614	0.00669
(12) Federal Republic of Germany		0.00146	0.00224	0.00604	0.00859
(19) Japan		0.00057	0.00106	0.00251	0.00395

Table VI. Comparison of the Current Updating Factors $(F_{C,U})$
With the Updating Factors Using ABI Data $(F_{A,U})$

Country	Country Code	Under $251				Between $251 and $1000			
		$F^1_{C,U}$	$F^1_{A,U}$	$F^1_{A,U}-F^1_{C,U}$	$(F^1_{A,U}-F^1_{C,U})/F^1_{C,U}$	$F^2_{C,U}$	$F^2_{A,U}$	$F^2_{A,U}-F^2_{C,U}$	$(F^2_{A,U}-F^2_{C,U})/F^2_{C,U}$
					%				%
A									
Canada	1220	0.00282	0.00390	0.00108	38.45	0.00886	0.01099	0.00213	24.04
Japan	5880	0.00143	0.00112	-0.00031	-21.91	0.00402	0.00319	-0.00083	-20.65
China T	5830	0.00409	0.00183	-0.00226	-55.19	0.01003	0.00772	-0.00231	-23.03
Italy	4750	0.01253	0.00752	-0.00501	-39.95	0.00686	0.00695	0.00009	1.31
FR Germ	4280	0.00299	0.00223	-0.00076	-25.37	0.00835	0.00673	-0.00162	-19.40
Mexico	2010	0.00254	0.00247	-0.00007	-2.92	0.00666	0.00728	0.00062	9.31
Hong Kong	5820	0.00690	0.00252	-0.00438	-63.44	0.01009	0.01122	0.00113	11.20
U. K.	4120	0.00374	0.00260	-0.00114	-30.36	0.00735	0.00742	0.00007	0.95
Kor Rep.	5800	0.00197	0.00077	-0.00120	-61.08	0.00327	0.00297	-0.00030	-9.17
France	4270	0.00619	0.00216	-0.00403	-65.13	0.00660	0.00494	-0.00166	-25.15
China M	5700	0.00273	0.00104	-0.00169	-61.76	0.00381	0.00520	0.00139	36.48
Singapore	5590	0.00114	0.00092	-0.00022	-19.17	0.00322	0.00283	-0.00039	-12.11
Switzerland	4410	0.00270	0.00340	0.00070	25.90	0.00625	0.00900	0.00275	44.00
B									
Brazil	3510	0.00121	0.00054	-0.00067	-55.53	0.00127	0.00100	-0.00027	-21.26
Netherlands	4210	0.00319	0.00214	-0.00105	-33.01	0.00954	0.00626	-0.00328	-34.38
Malaysia	5570	0.00152	0.00143	-0.00009	-5.67	0.00560	0.00623	0.00063	11.25
Sweden	4010	0.00288	0.00281	-0.00007	-2.56	0.00644	0.00711	0.00067	10.40
Phil R	5650	0.00617	0.00252	-0.00365	-59.13	0.00910	0.01116	0.00206	22.64
Thailand	5490	0.00259	0.00137	-0.00121	-46.74	0.00589	0.00581	-0.00008	-1.36
Belgium	4230	0.00165	0.00141	-0.00024	-14.48	0.00359	0.00370	0.00011	3.06
Spain	4700	0.00342	0.00142	-0.00200	-58.45	0.00505	0.00374	-0.00131	-25.94
India	5330	0.00481	0.00298	-0.00183	-37.95	0.00291	0.00898	0.00607	208.59

Table VI. Continued

Country	Country Code	Under $250				Between $251 and $1000			
		$F^1_{C,U}$	$F^1_{A,U}$	$F^1_{A,U}-F^1_{C,U}$	$(F^1_{A,U}-F^1_{C,U})/F^1_{C,U}$ %	$F^2_{C,U}$	$F^2_{A,U}$	$F^2_{A,U}-F^2_{C,U}$	$(F^2_{A,U}-F^2_{C,U})/F^2_{C,}$ %
Australia	6021	0.00117	0.00178	0.00062	52.98	0.00271	0.00405	0.00134	49.45
Dom Rep.	2470	0.00282	0.00087	-0.00195	-69.27	0.00563	0.00239	-0.00324	-57.55
Portugal	4710	0.00693	0.00296	-0.00397	-57.36	0.00738	0.00843	0.00105	14.23
Israel	5080	0.00104	0.00129	0.00026	24.80	0.00257	0.00501	0.00244	94.94
Costa Rica	2230	0.00198	0.00062	-0.00136	-68.54	0.00549	0.00220	-0.00329	-59.93
Haiti	2450	0.00810	0.00297	-0.00514	-63.44	0.00869	0.01244	0.00375	43.15
Finland	4050	0.00310	0.00084	-0.00226	-72.99	0.00533	0.00188	-0.00345	-64.73
Ireland	4190	0.00374	0.00314	-0.00060	-15.94	0.00446	0.00624	0.00178	39.91
Austria	4330	0.00476	0.00223	-0.00253	-53.12	0.00891	0.00637	-0.00254	-28.51
Yugoslavia	4790	0.00247	0.00206	-0.00041	-16.49	0.00294	0.01324	0.01030	350.34
Indonesia	5600	0.00084	0.00016	-0.00067	-80.02	0.00044	0.00028	-0.00016	-36.36
Macao	5660	0.00509	0.00104	-0.00405	-79.54	0.00402	0.00384	-0.00018	-4.48
Guatamala	2050	0.00247	0.00040	-0.00207	-83.92	0.00381	0.00027	-0.00354	-92.91
Jamaica	2410	0.00341	0.00041	-0.00300	-88.04	0.00571	0.00397	-0.00174	-30.47
Antigua	2484	0.00826	0.06075	0.05249	635.42	0.01541	0.34154	0.32613	2116.35
Colombia	3010	0.00493	0.00019	-0.00474	-96.15	0.01546	0.00066	-0.01475	-95.41
Uruguay	3550	0.00162	0.00024	-0.00138	-85.45	0.00041	0.00198	0.00157	382.93
Argentina	3570	0.00084	0.00058	-0.00026	-31.07	0.00176	0.00150	-0.00026	-14.77
Norway	4030	0.00144	0.00167	0.00023	15.88	0.00300	0.00434	0.00134	44.67
Hungary	4370	0.00298	0.00074	-0.00224	-75.32	0.00430	0.01256	0.00826	192.09
Greece	4840	0.00332	0.00207	-0.00125	-37.73	0.00362	0.00534	0.00172	47.51
Turkey	4890	0.00206	0.00034	-0.00172	-83.66	0.00146	0.00064	-0.00082	-56.16
Pakistan	5350	0.00465	0.00052	-0.00413	-88.72	0.00212	0.00639	0.00427	201.42
Bangladesh	5380	0.00093	0.00015	-0.00078	-84.38	0.00011	--	--	--
Sri Lanka	5420	0.00247	0.00112	-0.00135	-54.62	0.00183	0.00894	0.00711	388.52
New Zealand	6141	0.00162	0.00068	-0.00094	-57.97	0.00360	0.00238	-0.00122	-33.89

Table VII. Comparison of the Low Value Factor F^1 With the Same Increment Factor F^{IC}
by Country Using ABI Data

Country	Country Code	F^1	F^{IC}	$F^{IC}-F^1$	$(F^{IC}-F^1)/F^1$ %	Country	Country Code	F^1	F^{IC}	$F^{IC}-F^1$	$(F^{IC}-F^1)/$ %
A						**C**					
Canada	1220	0.00167	0.00263	0.00096	57.40	Australia	6021	0.00095	0.00121	0.00025	26.32
Japan	5880	0.00057	0.00082	0.00025	43.86	Dom Rep	2470	0.00040	0.00080	0.00040	100.00
China T	5830	0.00057	0.00101	0.00044	77.19	Portugal	4710	0.00111	0.00159	0.00048	43.24
Italy	4750	0.00295	0.00728	0.00433	146.78	Israel	5080	0.00034	0.00056	0.00022	64.71
FR Germany	4280	0.00146	0.00192	0.00046	31.64	Costa Rico	2230	0.00022	0.00070	0.00050	250.00
Mexico	2010	0.00206	0.00266	0.00060	29.13	Haiti	2450	0.00107	0.00155	0.00048	44.86
Hong Kong	5820	0.00123	0.00134	0.00011	8.94	Finland	4050	0.00050	0.00079	0.00029	58.00
U. K.	4120	0.00172	0.00225	0.00053	31.10	Ireland	4190	0.00111	0.00186	0.00075	67.57
Kor Rep	5800	0.00026	0.00039	0.00013	50.00	Austria	4330	0.00100	0.00137	0.00037	37.00
France	4270	0.00099	0.00160	0.00061	62.09	Yugoslavia	4790	0.00049	0.00129	0.00080	163.27
China M	5700	0.00023	0.00063	0.00040	175.65	Indonesia	5600	0.00021	0.00026	0.00005	23.81
Singapore	5590	0.00043	0.00059	0.00016	37.21	Macao	5660	0.00019	0.00050	0.00031	163.16
Switzerland	4410	0.00259	0.00331	0.00072	27.80	Guatamala	2050	0.00019	0.00029	0.00010	52.63
B						Jamaica	2410	0.00055	0.00041	-0.00014	-25.45
Brazil	3510	0.00025	0.00031	0.00006	24.00	Antigua	2484	0.23761	0.15031	-0.02665	-15.06
Netherlands	4210	0.00124	0.00149	0.00025	20.51	Colombia	3010	0.00008	0.00008	0	0
Malaysia	5570	0.00090	0.00143	0.00054	60.00	Uruguay	3550	0.00012	0.00027	0.00015	125.00
Sweden	4010	0.00215	0.00272	0.00057	26.51	Argentina	3570	0.00033	0.00044	0.00011	33.33
Phil R	5650	0.00097	0.00181	0.00084	86.60	Norway	4030	0.00046	0.00095	0.00049	106.52
Thailand	5490	0.00047	0.00071	0.00024	51.06	Hungary	4370	0.00099	0.00049	-0.00050	-50.51
Belgium	4230	0.00055	0.00092	0.00037	67.27	Greece	4840	0.00092	0.00166	0.00074	80.43
Spain	4700	0.00053	0.00071	0.00018	33.96	Turkey	4890	0.00012	0.00013	0.00001	8.33
India	5330	0.00124	0.00220	0.00096	77.42	Pakistan	5350	0.00039	0.00060	0.00021	53.85
						Bangladesh	5380	0.00010	0.00019	0.00009	90.00
						Sri Lanka	5420	0.00010	0.00020	0.00010	100.00
						New Zealand	6141	0.00031	0.00059	0.00028	90.32

Note: $F^1 = T_{(0,250]}/(T_{250+} - T_{(250, 1000]})$ $\quad F^{IC} = T_{(250, 500]}/(T_{250+} - T_{(250, 1000]})$